Title: Organizational readiness for change: Preceptor perceptions regarding early immersion of student pharmacists in health-system practice

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ABSTRACT

Purpose. To examine preceptors' perceptions regarding readiness for change pre- and post-implementation of a pilot early immersion program engaging student pharmacists in direct patient care.

Methods. Student pharmacists enrolled in the second professional year of a Doctor of Pharmacy degree program completed a four-week health-system introductory pharmacy practice experience (IPPE) which was modified to include direct patient care roles in operational (drug preparation and dispensing) and clinical (comprehensive medication management) pharmacy environments. Pharmacy preceptors with direct oversight for program implementation completed a pre/post Organizational Readiness for Implementing Change (ORIC) survey and a 50-minute interview or focus group post-experience. The ORIC survey evaluates two dimensions of organizational readiness for change – change commitment and change efficacy. Additional items assessed included implementation needs, support, and perceived value of the change. ORIC survey constructs were compared before and after the experience. Interviews and focus groups were audio recorded, transcribed, and evaluated by constant comparative analysis. A mixed methods approach was used to triangulate findings and develop greater understanding of the ORIC survey results.

Results. Twenty pharmacy preceptors (37 ± 8 years of age, 60% female, 65% clinical pharmacist position, 70% prior preceptor experience) participated in the study. There were no significant changes in pre/post survey constructs, except for a decline in the perception of organizational change commitment ($p<0.001$). Sub-analyses indicated the decline was associated with items assessing individual dedication and individual commitment to the change ($p<0.05$ for both). Primary emerging themes from interviews included concerns about implementation

requirements, contextual factors of the experience that affected implementation, and varying perceptions about the value of early immersion across preceptor roles.

Conclusion. As pharmacy curricula immerse student pharmacists in practice earlier in their education, pharmacy departments can utilize the ORIC survey to identify preceptors' commitment and concerns to support the necessary changes for student pharmacist engagement.

Keywords: student pharmacist, introductory pharmacy practice experience, readiness for change, organizational change, implementation science, and pharmacy practice

Introduction

The American Society of Health-System Pharmacists (ASHP) 2015 Initiative highlights the importance of achieving optimal medication use in inpatient practice.[1] Student pharmacists are poised to engage and aid in pharmacists' provision of patient care to meet these goals.[2,3] A number of studies evaluating the integration of student pharmacists into health-system and hospital pharmacy practices have shown positive impacts in both educational outcomes and organizational initiatives.[4-9] While the majority of investigations focus on fourth professional year student pharmacists during advanced pharmacy practice experiences (APPEs), there is a growing interest in the potential impact of immersing student pharmacists earlier into practice settings. Initial research suggests second professional year student pharmacists can be effectively engaged in direct patient care activities, such as the medication reconciliation process.[10-11] Participation in these initiatives can lead to enhanced learning and development[10] as well as contribute to organizational outcomes through the identification of medication-related problems and discrepancies.[11,12]

Unfortunately, there exist many barriers to the successful implementation of early student pharmacist experiences from the organizational perspective. Limited site capacity, inadequate preceptor training, lack of standard experiences across sites, as well as insufficient resources and time have been identified as some of the significant concerns facing pharmacy experiential educational programs and medical institutions.[13,14] These challenges can limit both individual and organizational readiness for change to embrace current experiential models. To respond to initiatives focused on the incorporation of student pharmacists in pharmacy practice models, readiness for change from an individual and organizational level must be considered for successful implementation.

Present theories of organizational readiness for change describe the factors associated with effective program implementation and are a function of individual and organizational values and perceptions.[15] Organizational readiness for change can be thought of in terms of two dimensions: the collective determination of members to implement a change (change commitment) and the shared belief in their ability to do so (change efficacy).[16] As organizational readiness for change increases, members are more likely to provide greater effort and persistence, therefore, leading to more effective enactment of the desired task.[15] A hypothesized determinant of change commitment is change valence, that is, the extent to which organizational members value the change and think it is important and worthwhile.[15] Hypothesized determinants of change efficacy include perceptions about the task demands of the change (e.g., the necessary courses of action, the appropriate sequencing of activities); the available resources to support the change implementation (e.g., human, financial and information resources needed for the change); and situational factors (e.g., whether there is sufficient time to implement the change).[15] Currently, the pharmacy literature is devoid of research investigating the factors associated with readiness to implement immersive student education programs in health-systems pharmacy practice and the potential for perceptions of readiness to evolve following a pilot program.

In an effort to engage student pharmacists in authentic, direct patient care activities at an earlier stage in their professional education, a pilot program was designed to provide second professional year student pharmacists with an immersive health-system introductory pharmacy practice experience (IPPE) at a major academic medical center. The goal of the redesigned learning experience was to foster direct patient care experiences that would provide for more meaningful learning opportunities compared to shadowing experiences previously organized.

The purpose of this study was to examine organizational readiness for change surrounding the implementation of this program at a single academic medical center with a focus on the perceptions of pharmacist preceptors and key personnel involved in the process. Specifically, the study assessed organizational and individual readiness pre- and post- implementation of a small-scale pilot early-immersion program. The pilot served as a trial of the IPPE program to better understand the change required of pharmacy preceptors and potentially inform implementers of attributes to increase readiness on a broader scale with future efforts. For example, it could identify salient attributes for the implementers to address as the program was expanded to other institutions and pharmacy settings. In summary, the study offers a systematic approach to identifying factors influencing program implementation in pharmacy practice, from the perspective of important stakeholders, while drawing from the theoretical framework of organizational readiness for change.

Methods

The IPPE Pilot and Participants

During transition from the first to second professional year in the Doctor of Pharmacy degree program, student pharmacists were required to complete a four-week IPPE in health-system practice at a large academic medical center. The structure of the redesigned IPPE, learning goals, training processes for preceptors and student pharmacists, and positive educational outcomes associated with the program have been described in detail elsewhere.[17] In brief, this experience was restructured to involve two-week experiences in both operational and clinical pharmacy environments at the [blinded for review] from May to June 2015. During their time in the operational environment, student pharmacists concentrated on development of skills in sterile and non-sterile product preparation and dispensing. During their time in the clinical

environment, student pharmacists were involved with several aspects of the comprehensive medication management process including reviewing medical and medication information in the electronic medical record, performing medication histories with patients and/or caregivers, presenting a basic assessment and plan to a pharmacist preceptor, engaging in discharge medication education, responding to drug information requests, and documenting detailed medication histories in the medical record in accordance with standards set by the institution.

Several individuals participated in the delivery of this IPPE including operational and clinical pharmacy managers, operational and clinical pharmacists, pharmacy residents, and pharmacy technicians. A detailed summary of the differences in roles and expectations for participants in the early immersion program in comparison to the traditional IPPE is provided in Table 1. Compared to the traditional IPPE in which preceptors typically provided one day shadowing opportunities for student pharmacists with minimal engagement in the student development process, implementation requirements for the redesigned experience necessitated increased commitment by preceptors to engage in daily educational activities and scheduled competency assessments. To aid in the transition, key personnel from the school of pharmacy responsible for the implementation assisted preceptors by outlining the new expectations of the immersive experiences and meeting with preceptors to address concerns prior to initiation.

Preceptors who had direct oversight responsibility for a pharmacy team engaged in the IPPE program implementation were eligible to participate in the study. This group consisted of pharmacist managers (operational and clinical environments), clinical pharmacists responsible for patient care services, and technician managers. Pharmacy residents and technicians were excluded since they do not have direct oversight responsibility for the IPPE program implementation. This study protocol was submitted and considered exempt from review by the

Institutional Review Board at our institution. Participants provided written informed consent. Participants were not offered incentives for their participation.

Survey Data Collection

Eligible and willing preceptors completed a participant demographics survey including position title, practice environment, and previous preceptor experience via an electronic survey platform. In addition, participants completed an assessment of organizational readiness for change prior to the initiation of the immersion program training and immediately following the program's conclusion via an electronic survey platform. The readiness for change assessment included the 10-item Organizational Readiness for Implementing Change (ORIC) survey as well as additional items hypothesized to be determinants of readiness based on Weiner's theory of organizational readiness for change.[15,18] The ORIC survey is a theory-based tool designed to evaluate organization members' readiness for change prior to the implementation of a desired program or initiative. A psychometric analysis using the survey in simulated and genuine health care settings has shown to produce valid and reliable measures that appropriately reflect important constructs of organizational readiness for change, specifically change commitment and change efficacy.[18] In our survey, individuals were asked to rate their level of agreement with the ORIC items measuring change commitment and change efficacy, as well as the additional hypothesized determinants, using a 5-point Likert scale. These hypothesized determinants include change valence, task knowledge, resource availability, and leadership support.[15] The research team reviewed all edits to the instrument for face validity and Cronbach's alpha was used to examine the reliability of the final instrument. A complete list of the survey statements and their related constructs can be found in Table 2. The use of this tool in pharmacy practice has

not been evaluated previously; however, it has potential to be beneficial in the understanding of readiness for change with respect to experiential education or other programmatic initiatives.

Qualitative Data Collection

A mixed methods approach was used to triangulate findings and develop greater understanding of the ORIC survey results**.** Focus groups and semi-structured interviews were used to collect more data regarding preceptor perceptions of the pilot program and readiness for implementation following the completion of the experience. Individuals who participated in the survey were subsequently invited to attend one of three 50-minute focus groups, which were organized based on their area of practice (either operational or clinical). Two participants who were unable to attend a focus group due to scheduling conflicts were asked to share their opinions through a semi-structured interview of approximately the same duration. One of the researchers served as a facilitator during all focus group and interview sessions to lead discussion using an open-ended interview guide developed by the research team prior to program initiation. The same questions were used for the focus group and interview sessions and pertained to (1) preceptor perception regarding the value of involving student pharmacists in direct patient care experiences; (2) aspects of implementation perceived to be successful; (3) barriers encountered during program implementation; and (4) preceptor development and training needed to better prepare for earlier immersion of student pharmacists. The questions were developed to expand on key constructs of the ORIC survey while offering a venue for preceptors to express their feelings regarding the program and its implementation. The qualitative data were intended to expand on the ORIC survey findings and verify emerging trends. All sessions were audio recorded and transcribed verbatim by a research assistant without personal identifiers and confirmed by senior research team members for accuracy.

Analysis

Descriptive statistics were used to characterize all quantitative variables from the survey. Data are presented as medians (interquartile range) for continuous variables and percentages for categorical variables. Results from the survey data were aggregated by grouping survey responses pertaining to the six evaluated constructs. Due to the small sample sizes and Likert scale data, the Wilcoxon signed rank test was used to compare the median construct scores of the pre- and post-surveys. For constructs with a statistically significant change from before to after the implementation, the Wilcoxon signed rank test was used to determine which survey item pertaining to the identified construct contributed to a statistically significant difference. Statistical significance was established *a priori* at an alpha of 0.05. Cronbach alpha was also calculated to evaluate the consistency of each variable in measuring the planned constructs. Cronbach alpha values greater than 0.7 were considered an appropriate indication of internal consistency. All quantitative data analyses were performed using the Program R for Mac, Version 3.2.2 (Vienna, Austria).

The focus group and semi-structured interview data were analyzed using thematic coding. A constant comparative approach was used by three of the researchers who independently reviewed the transcripts from the focus groups and interviews. Existing and emerging themes were identified based on a pre-determined coding structure using the organizational readiness for change framework including: implementation requirements, available support, needed support, contextual factors, change value, individual and organizational change commitment, and individual and organizational change efficacy.[15,16,18] A complete list of the codes and their definitions is located in Table 3. Following the initial independent review, the researchers discussed findings to identify and define coding sub-categories. Transcripts were then reviewed

independently by the three researchers utilizing a more elaborate coding scheme which included the additional sub-categories. Following the completion of the second coding cycle, the researchers met to review findings and reach consensus on the presence of major themes and concepts addressed by the participants. In cases where thematic coding diverged, two additional researchers were incorporated to reach an agreement. The qualitative findings were used to reinforce the results of the pre- and post-ORIC surveys to a greater extent. Select quotes from the focus groups and interviews are provided as supporting evidence for the qualitative and quantitative findings.

Results

Survey Results

A total of 20 pharmacist managers, clinical pharmacists, and technician managers completed the ORIC survey before and after the immersion program (100% response rate) (Table 4). A majority of the participants were female (12 out of 20) and had worked at the current institution for less than 10 years (17 out of 20). Of the pharmacists, most practice as clinical pharmacists (13 out of 16) and all had completed some form of post-graduate training, the most frequent being at least one year of residency (15 out of 16). All of the pharmacists had served in some capacity as a preceptor for APPE student pharmacists; however, only 9 of the 16 participants had functioned as primary or co-preceptor for IPPE student pharmacists. Preceptors often had less than 10 years of experience as preceptors for APPE student pharmacists (13 of 16), whereas those who were IPPE preceptors had mostly 5 years of experience or less (8 out of 9). All of the technicians who completed the survey had at least 6 years of work experience (4 out of 4). The extent of technicians' previous experience teaching or interacting with student pharmacists was not evaluated.

Overall, the median of the aggregate scores for each of the six constructs prior to and following program implementation were generally high with results of either 4 (somewhat agree) or 5 (strongly agree). A comparison of the aggregate median construct scores for the pre- and post-ORIC survey using the Wilcoxon signed rank revealed a statistically significant decline ($p<0.001$) in the perception of change commitment. As shown in Table 5, there were no differences identified in the other constructs evaluated. For each item pertaining to change commitment in the survey, median scores were compared using the Wilcoxon signed rank test to locate potential reasons for this decline. A statistically significant decline was detected for two items in the ORIC survey pertaining to change commitment: "We are committed to implementing this change" (pre-median 5 to post-median 4; $p<0.05$) and "We are determined to implement this change" (pre-median 4 to post-median 4; $p<0.05$). With regards to the second item, the notable decline is due to the greater variance in the reported values by preceptors despite the similar median between groups (Table 5). The overall Cronbach alpha for the survey was 0.92 with each aggregated construct having an alpha value of 0.69 or greater. This provides justification for the method of item aggregation based on the selected constructs and suggests the measures were sufficiently consistent, with the exception of resource availability.

Qualitative Results

Based on the high frequency of discussion by participants, the researchers concluded the prominent themes centered on contextual factors, implementation requirements, and change value. The group worked to identify particular sub-codes for each of the major constructs to better understand the perceptions and contributions of these factors. With regards to contextual factors, preceptors often discussed the significance of the timing of the implementation in summer months, unit staffing shortages, capacity restrictions, and competing priorities including

other learners, such as residents or fourth professional year student pharmacists. Discussion of implementation requirements centered on challenges with daily activity logistics and planning, technical system use such as electronic medical record access, and methods to concurrently manage learners of varying knowledge and skill levels. The perception of change value communicated was diverse as some preceptors noted benefits of student immersion for the health-system and practice in general, while others noted particular challenges and did not recognize a long-term gain. With respect to clinical services, a majority of preceptors agreed student pharmacists effectively contributed to the organizational goals as desired.

Following the second independent analysis with the additional sub-codes, the researchers collected and reviewed all coding to develop a list of example quotations pertinent to the survey constructs, which are provided in Table 5. The qualitative data were compared with the quantitative results to determine key features that related to readiness for change. Of note, the researchers found that preceptors rarely spoke of organizational benefits or challenges during focus group and interview sessions. Instead many preceptors focused on particular benefits to themselves, their learners, or their specific clinical service or operational area.

Discussion

This study adds to a growing body of research about organizational readiness for change in the health sciences literature. The concept of organizational readiness for change has been previously applied across various disciplines, including medicine, public health, and behavioral health and substance use, as well as within various settings, including hospitals, physician practices, and the Veterans Health Administration.[19-24] However, this is the first study to utilize the organizational readiness for change theoretical framework to systematically assess factors

influencing implementation of a new experiential education program for early learners in pharmacy practice.

The current study used the ORIC survey to measure organizational readiness for change. Although there are multiple instruments in the literature that assess readiness for change, there is no gold standard. In addition to ORIC, others have been widely used, such as the 115-item Texas Christian University organizational readiness for change (TCU-ORC) survey and the 77-item organizational readiness to change assessment (ORCA).[25-26] We chose to use the ORIC survey for this study because it is theory-based, brief (10 items), applicable to various organizational settings that extend beyond clinical practice, and appropriate for both clinical and non-clinical respondents.[18] The findings from the ORIC survey suggest preceptors and pharmacy personnel were generally ready for the implementation of the immersion program as noted by the high level of agreement with survey items. Interestingly, scores on one construct, change commitment, were shown to change significantly following the pilot program. This decline in change commitment indicates that the experience from implementing the pilot may have negatively influenced some preceptors' willingness to participate. The qualitative findings of this study may help to verify and partially explain the decline in change commitment observed. Prominent themes focused primarily on barriers to implementation, such as contextual factors, implementation requirements, and perceived value of the program. Another key finding identified in this study was that participants tended to focus on the individual-level issues in comparison to broader organizational-level issues. These findings suggest a potential misalignment between organizational priorities and individual goals when considering the implementation of this new program.

This study is novel in its use of a measure of organizational readiness for change before and after the implementation of a pilot educational intervention. The ORIC survey utilized in this study represents a new application that illustrates organizational readiness for change is not static. Experience with a new program may shape perceptions about its requirements and value. Coupled with qualitative findings in a mixed methods approach, the survey results also identified determinants of perceived readiness, which is useful for informing future implementation efforts.

Our findings, complemented by previous implementation science literature, suggest several approaches for future program implementers to consider. For example, implementation frameworks, such as the Consolidated Framework for Implementation Research (CFIR), suggest that implementation planning should involve consideration of stakeholders' needs and perspectives.[27] Future program developers and implementers would be well served to further explore the concerns participants have about program implementation utilizing a mixed methods approach and subsequently develop strategies that could increase the perceived value and reduce the perceived task demands. Based on variation of perceived value observed in this study between operational and clinical services, it will be essential for future program implementers to develop strategies that are tailored to the local practice environment. Additionally, efforts for program implementers to communicate how the new program aligns with organizational priorities could promote higher perceived value of the change.

The implementation of new experiential education programs in pharmacy practice represents a significant challenge to schools of pharmacy and partner organizations. This study has provided a starting point to identify specific areas that may require targeted monitoring or assistance prior to and during the full-scale implementation of practice-based education programs. Following completion of this study, an explicit implementation plan was developed by

faculty at the school of pharmacy and partner sites to expand this experience to several institutions. First, a continuous mechanism was developed for partner sites to share concerns regarding program implementation. Second, integration of assessment data has been utilized to develop sequential and cohesive didactic classes with immersion. Refinement of didactic class content to improve perceived value and reduce task demands for preceptors has occurred by ensuring student pharmacists were better prepared to participate effectively at practice sites. Finally, full-scale implementation has also included delivery of preceptor development programs offered by the school to better align the new program with organizational priorities of the collaborating partner sites.

There are several potential limitations of this study. First, the perspectives reflected by participants represent those of individuals with less than 10 years of experience at one institution; however, the program evaluation captured a wide range of perspectives of pharmacy personnel from varying practice environments, positions, and education experience. Second, the sample size was small and may have not been sufficiently powered to show an appreciable change in the ORIC constructs. The mixed methods approach with triangulation of findings from qualitative data helps to offset this potential limitation. Third, the ORIC has been studied in simulated and live contexts[18], but it has not been extensively studied in educational or pharmacy settings or to assess organizational readiness pre- and post-implementation of a small-scale pilot program. Finally, it is plausible the questions developed by the study team for the focus groups and semi-structured interviews emphasized individual implementation experiences compared to questions focused more on the organizational impact and beliefs. As such, this may partially explain the lack of alignment seen between organizational priorities and individual goals.

Conclusion

The implementation of programs that differ substantially from current practices can pose a significant challenge for institutions. This study suggests there are multiple aspects for schools of pharmacy to address when implementing programs that affect experiential education. Most importantly, institutions must evaluate the needs of preceptors and other stakeholders that may be affected by such initiatives and work to resolve perceived deficits to enhance participation. For successful collaboration between a school of pharmacy and a partner site, more efforts should be made to guarantee organizational and individual readiness are aligned to ensure preceptor commitment for student pharmacist engagement. Future research in experiential education should incorporate implementation science principles related to assessing barriers and targeting these barriers with appropriate implementation strategies.

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Table 1. Role Comparison of Pharmacy Staff Engaged in the Traditional and Redesigned Introductory Pharmacy Practice Experience

Participant	Role in Traditional IPPE	Role in Redesigned IPPE
Pharmacist Managers	Serve as preceptor of record Coordinate PGY-2 Health-System Pharmacy Administration Resident oversight of student experiences Provide shadowing experiences consisting of 1 day, if needed	Serve as preceptor of record Provide area-specific student pharmacist orientation and training roadmap Serve as primary point of contact for area-specific issues/concerns Coordinate training and execution of staff approach to student education Contribute to midpoint and final experience evaluations
Clinical Pharmacists	Provide shadowing experiences consisting of 1-3 days of direct student pharmacist precepting per experience, if needed	Direct oversight of clinical experiences and student pharmacist education Two week long preceptor-student pharmacist interaction
Operations Pharmacists	Provide shadowing experiences consisting of 1 day, if needed	No change in role Reduced total contact days
Pharmacy Technician Managers	Provide shadowing experiences consisting of 1 day as needed	Team-based precepting approach with shared daily student pharmacist education Increased total contact days Evaluated operational competency assessments for student pharmacists
Pharmacy Residents	PGY-2 Health-System Pharmacy Administration Residents: Serve as primary contact for student pharmacist issues/concerns, schedule student pharmacist orientation, develop student pharmacist schedules, lead topic discussions, engage in student	PGY-2 Health-System Pharmacy Administration Residents: Assist pharmacist managers with coordination, evaluate clinical competency assessments for student pharmacists

	pharmacist assessment, and provide 1-1 student pharmacist training	Other residents: If scheduled and sharing a clinical pharmacist preceptor with an IPPE student, may functionally serve as student pharmacist's co-preceptor and provide medication history training
Student Pharmacists	Observational role for time of the experience Occasional direct involvement in patient care, but only at specific site locations	Encouraged to be directly active in >95% of the IPPE in the areas of medication use and comprehensive medication management processes Involved in delivery tracking and waste reduction programs

PGY-2: Post-Graduate Year 2

IPPE: Introductory Pharmacy Practice Experience

Table 2. Primary constructs and related survey statements

Construct 1: Change Commitment (5 items)
We are committed to implementing this change.
We will do whatever it takes to implement this change.
We want to implement this change.
We are determined to implement this change.
We are motivated to implement this change.
Construct 2: Change Efficacy (5 items)
We are confident that we can handle the challenges that might arise in implementing this change.
We are confident that we can keep track of progress in implementing this change.
We are confident that we can coordinate tasks so that implementation goes smoothly.
We feel confident that our pharmacy department can support people as they adjust to this change.
We feel confident that we can manage the politics of implementing this change.
Construct 3: Change Valence / Value (2 items)
We believe implementing this change will benefit patients.
We believe implementing this change will benefit students.
Construct 4: Task Knowledge (3 items)
We know how much time it will take to implement this change.
We know what resources we need to implement this change.
We know what each of us has to do to implement this change.
Construct 5: Resource Availability (6 items)

We have the time we need to implement this change.
We have the staff we need to implement this change.
We have the space we need to implement this change.
We have the skills to implement this change.
We have the resources we need to implement this change.
We have the expertise to implement this change.
Construct 6: Leadership Support (2 items)
Leadership within our pharmacy department is committed to implementing this change.
Leadership at the School is committed to working with us to implement this change.

Table 3: Qualitative data codebook

Theme	Description
1. Organizational Change Commitment	Participants talk about the extent to which members in their unit want to implement early immersion (i.e. shared resolved or willingness to pursue implementation)
2. Individual Change Commitment	Participants talk about the extent to they personally want to implement early immersion (i.e. individual resolve or willingness to pursue implementation)
3. Change Value	Participants discuss perceptions about the extent to which early immersion is needed, important, beneficial and / or worthwhile with respect to students or the organization
- Organizational positive	Pertains to benefit to preceptor, work unit, patient, and / or healthcare system
- Organizational negative	Pertains to lack of benefit to preceptor, work unit, patient, and / or healthcare system
- Individual positive	Pertains to benefit to student and / or higher level learner
- Individual negative	Pertains to lack of benefit to student and / or higher level learner
4. Organizational Change Efficacy	Participants talk about the extent to which members in their unit are capable of implementing early immersion

5. Individual Change Efficacy	Participants talk about the extent to which they personally are able to implement early immersion and / or their knowledge and skills (or lack of) in relation to implementing early immersion
6. Implementation Requirements	Participants talk about the activities they completed to prepare for early immersion students and / or activities they performed while students were present
- Logistics of daily activities	Pertains to scheduling and evaluation requirements
- Technical / information system use	Pertains to access to electronic resources and / or tools
- Learner layering aspects	Pertains to coordination and / or attention to multiple levels of learners in one setting
7. Available Support	Participants talk about the support that they perceive to be available for implementing early immersion
8. Needed Support	Participants talk about the types of support that they would like to have to continue with or sustain the early immersion program
9. Contextual Factors	Participants talk about factors that affected implementation that were generally beyond the control of the individual preceptor
- Timing of implementation	Pertains to conflicts and / or benefits of implementation in certain times or months of the year
- Unit staffing issues	Pertains to sufficient and / or insufficient number of staff to accommodate needs of students

- Competing priorities	Pertains to balance of concurrent changes occurring in the setting other than the early immersion program
- Capacity	Pertains to space limitations and / or the number of students

Table 4. Participant Demographics N=20

Demographic	
Female, n (%)	12 (60%)
Age, median (interquartile range)	36.5 (7.8)
Position Title, n (%)	
Clinical Pharmacist Technician Manager Pharmacist Manager	13 (65%) 4 (20%) 3 (15%)
Primary Practice Environment, n (%)	
Medicine Cardiology / Heart / Vascular Oncology Acute Care Operations Surgery No Response	6 (30%) 4 (20%) 2 (10%) 1 (5%) 1 (5%) 6 (30%)
Year of Practice at Current Institution, n (%)	
< 5 years 6-10 years	9 (45%) 8 (40%)

11-20 years > 20 years	2 (10%) 1 (5%)
Pharmacist Experience (n = 16)	
Post-Graduate Training, n (%)	
PGY-1 Residency (clinical intensive post-graduate experience) PGY-2 Residency (clinical specialty intensive post-graduate experience) Graduate Degree (e.g., MPH, PhD, MHA) Fellowship (research intensive post-graduate experience) No post-graduate training	15 (94%) 13 (81%) 4 (25%) 1 (6%) 0 (0%)
Board Certification, n (%)	13 (81%)
Additional Qualifications, n (%)	3 (19%)
Years of Practice Experience Since PharmD / BSPharm Completion, n (%)	
< 5 years 6-10 years 11-20 years > 20 years	3 (19%) 7 (44%) 5 (31%) 1 (6%)
Served as a Primary or Co-Preceptor for Student Pharmacists on IPPEs, n (%)	9 (56%)
Years of Experience Serving as a Primary or Co-Preceptor for Student Pharmacists on IPPEs n(%)	
< 5 years 6-10 years	8 (89%) 1 (11%)

Served as a Primary or Co-Preceptor for Student Pharmacists on APPEs, n (%)	16 (100%)
Years of Experience Serving as a Primary or Co-Preceptor for Student Pharmacists on APPEs, n (%)	
< 5 years	8 (50%)
6-10 years	5 (31%)
11-20 years	2 (13%)
> 20 years	1 (6%)
Technician Specific Items (n = 4)	
Pharmacy Technician Certification, n (%)	2 (50%)
Years of Practice Experience As Pharmacy Technician, n (%)	
6-10 years	2 (50%)
11-20 years	2 (50%)

PGY-1: Post-Graduate Year 1

PGY-2: Post-Graduate Year 2

MPH: Master of Public Health

MHA: Master of Health/Healthcare Administration

PhD: Doctor of Philosophy

PharmD: Doctor of Pharmacy

BSPharm: Bachelor of Pharmacy

IPPEs: Introductory Pharmacy Practice Experiences

APPEs: Advanced Pharmacy Practice Experiences

Table 5. Pre- and post- Organizational Readiness for Implementing Change (ORIC) survey results with sample quotes from qualitative focus group data coded to each construct

Construct[a,b]	Pre-ORIC Median (Range)	Post-ORIC Median (Range)	p-value
Change Commitment (5 items; α = 0.89)	4 (2-5)	4 (1-5)	< 0.001
• *"If they are really coming in with absolutely no outside experience, that is going to be a much bigger challenge to teach them how to talk to patients."(clinical pharmacist)* • *"I am very challenged with how these individuals could be useful…given a set of time frame like we are talking about rather than say a one to two month experience…from an operational standpoint given the upfront investment in training and with our staff is very significant."(operations pharmacist)* • *"It overall was a great experience. I am so glad to be working with a school that has a different mindset."(clinical pharmacist)* • *"I would want somebody dedicated to teach them how to talk to patients, that's not me."(clinical pharmacist)*			
Change Efficacy (5 items; α = 0.78)	4 (1-5)	4 (1-5)	0.84
• *"People are really going to be looking for what are preceptor expectations for this level of student as well in terms of what is expected of me to provide." (clinical pharmacist)* • *"It seems like it is not going to be a one-size fits all."(clinical pharmacist)*			

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- *"There is such a gap now between what I am thinking about and doing… it is harder for me to reach where they are."(clinical pharmacist)*
- *"I was not able to do the amount of coaching that the student needed and I recognized it."(clinical pharmacist)*

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<tr><td>Change Valence / Value

(2 items; α = N/A)</td><td>5

(1-5)</td><td>5

(2-5)</td><td>1.00</td></tr>
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- *"When they do come back to us during their fourth year... they should need a lot less direction … they are already familiar with a lot of the day-to-day activities of different types of services"(clinical pharmacist)*
- *"Operationally… the feedback that I have heard is it is probably going to take a bit longer… for them to truly… be kind of independent in their work"(technician manager)*
- *"They really have been incorporated and involved in patient care in a way that… actually is contributing to our team in a positive way"(clinical pharmacist)*
- *"I would make the statement that the students that we had and the exposure that we had, that they were not of value"(operational pharmacist)*

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<tr><td>Task Knowledge

(3 items; α = 0.84)</td><td>4

(1-5)</td><td>4

(1-5)</td><td>0.55</td></tr>
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- *"I think if we know what they are going to have the exposure to, will help plan it."(clinical pharmacist)*
- *"Their level of knowledge is completely not what I am used to from the fourth-year students."(clinical pharmacist)*

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Resource Availability (6 items; α = 0.69)	4 (1-5)	4 (1-5)	0.38
• *"Just the physical presence of that many additional people was substantially impactful on workflow."(technician manager)* • *"The space issue was a major problem."(clinical pharmacist)* • *"I can only have two people on rounds… so I had to kind of figure out how to do that."(clinical pharmacist)* • *"Once you start adding people and more people it becomes very congested… it does effect the other technicians."(operations pharmacist)*			
Leadership Support (2 items; α = N/A)	4 (1-5)	4 (2-5)	0.78
• *"It really does take a lot of time to manage the team."(clinical pharmacist)* • *"If somehow in collaboration with the school, if there was almost like…what would be appropriate for an educational discussion for them."(clinical pharmacist)*			

[a]Total Cronbach α = 0.92

[b]Each item measured on a 5-point Likert scale from strongly disagree (1) to strongly agree (5).